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# SCIENCE NEWS LETTER



MAR 31 1944

THE WEEKLY SUMMARY OF CURRENT SCIENCE • MARCH 25, 1944



Peanut Paradise  
See Page 201

A SCIENCE SERVICE PUBLICATION



## Foothold in a Fog



*Smoke Generator in Action*

Good weather is bad weather for an invasion. When American troops land on enemy beaches, it's often under cover of a friendly life-saving "fog."

American scientific and engineering ingenuity provided the equipment for our forces to make their own special invasion weather. For the "fog" is produced artificially by mobile smoke generators which blanket whole areas in an impenetrable white mist.

Months ago, the National Defense Research Committee enlisted the help of General Electric research scientists in developing an improved smoke generator for the Chemical Warfare Service.

Nobel prize winner Dr. Irving Langmuir

and his associates evolved a new principle of smoke generation, upon which the Standard Oil Development Company designed and built the equipment. The smoke it produces is harmless; it doesn't even soil clothes. But it does keep our troops and their movements from the sharp eyes of enemy aircraft.

This smoke generator, which according to reports has saved lives in Allied landings wherever it has been used, is another example of American industry's research and engineering and manufacturing skill. Producing superior weapons for our troops today, these same resources will be available for all the American people tomorrow in building a better world. *General Electric Company, Schenectady, New York.*

192,000 employees of General Electric are buying over a million dollars of War Bonds every week.

Hear the General Electric radio programs: "The G-E All-girl Orchestra" Sunday 10 p.m. EWT, NBC—"The World Today" news, every weekday 6:45 p.m. EWT, CBS.

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**GENERAL**  **ELECTRIC**

## CHEMISTRY

# Chemical Prevents Mud

Newly developed resin compound which makes soil water-proof may end muddy streets and country roads. Has been successfully used on airplane fields.

► THE DEVELOPMENT of a chemical which may end muddy streets and country roads, and prove a timesaving aid in construction work where mud may cause delays, has been announced by the Hercules Powder Company. Designed to prevent mud by making soil water-proof, this resin compound has already been successfully used on roads, airplane landing fields and other construction projects in the United States and abroad, company officials report.

Areas treated with the resin compound may be used for construction traffic immediately after rain without danger of bogging down or rutting the surface, it is claimed. A car splashing through a puddle on a treated dirt road will kick up dry dust—not mud—behind it.

By mixing the resin compound, called

Stabinol, with the top few inches of soil, a water-proof surface is obtained. It will not allow the water to seep through the treated soil and turn it into mud, company officials explained. It also resists the rise of moisture from below by capillary action. The water either is drained off or evaporates.

The product is a combination of a specially treated resin and other chemicals in the form of a dry powder suitable for easy mixing with the soil. The treated soil looks just like the original dirt.

Only a small amount of the resin compound is required, usually about one per cent of the total soil to be treated, and the material itself is quite inexpensive, costing well under ten cents a pound. Although the amount varies with the composition of the soil, on the

average about five pounds is needed per square yard. The soil stabilization will last for years, it is believed.

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## CHEMISTRY

## Yeast Cells May Be Used To Manufacture Biotin

► MICRO-ORGANISMS, already used to produce disease-fighting substances of which the most famous example is penicillin, may next be enlisted by scientists for manufacture of a vitamin chemical, biotin. This possibility is suggested in a report by Prof. Vincent du Vigneaud, Dr. Karl Dittmer and Dr. Donald B. Melville, of Cornell University Medical College. (*Science*, March 10).

Biotin is necessary for the growth of yeast and other microorganisms. Its role in human nutrition is not definitely known but once more ample supplies of the vitamin are available, this knowledge may be gained.

Synthesis of biotin in the laboratory has been achieved following elucidation of its structural formula by Prof. du Vigneaud and associates. More recently they have prepared from biotin another chemical, desthiobiotin, which also promotes the growth of yeast and some but not all the other microorganisms whose growth is promoted by biotin. In fact, at certain concentrations, desthiobiotin was found to have an anti-biotin effect for one such organism, *Lactobacillus casei*.

Growing yeast cells, they now report, can apparently convert desthiobiotin into biotin. Since desthiobiotin can be synthesized more easily than biotin in the laboratory, they suggest that yeast or some other microorganism which can convert larger amounts of desthiobiotin to biotin may be used for more easily obtaining supplies of biotin itself.

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## MILITARY SCIENCE

## Army Limits Use in U. S. Of 80-Octane Gasoline

► NEW gasoline conservation measures just adopted by the Army for all of its jeeps, trucks and other motor vehicles operated within continental United States, place definite limitations on the use of its 80-octane all-purpose, all-weather fuel. This high-power fuel will continue to be used in all combat vehicles in this country because their en-



**PROPHECY**—Country roads impassable after rainy weather because of muddy ruts may be made usable by application of a new chemical. The mud-preventive qualities of this resin compound, called Stabinol, are here graphically illustrated. At 12 noon two cores of soil were placed in dishes and water poured over them. Some minutes later one-kilogram weights were placed on the samples. The untreated core (left) immediately collapsed into ooze, but the stabilized core (right) supported the weight. Many treated cores will support the weight of a man after being submerged for long periods.

gines are designed particularly for its use.

The 80-octane gasoline will be available for all vehicles taking part in maneuvers in which battle conditions are simulated, so that troops may know the powers and limitations of their equipment under the same operating conditions they will encounter in actual combat.

However, all ordinary-purpose Army vehicles from now on will use 72-octane gasoline, the gasoline used in many if not most civilian cars and trucks. The new Army limitations, of course, do not apply to aviation fuels.

The octane number of a gasoline indicates its detonation or fuel-knock rating. It is a scale suggested by a petroleum engineer in 1926 and later adopted by the Society of American Engineers. It is now almost universally used.

The octane number of any particular fuel is determined by matching its anti-

knock value with that of a mixture of normal heptane and isoctane, both petroleum derivatives. Heptane detonates even at low compression ratios; isoctane does not detonate except at high compression. By trial, a mixture of these two can be found which duplicates the detonation of the fuel under test. The percentage of the isoctane in the mixture is the octane number of the fuel.

Fuels with an octane number higher than 100, as in the well-known aviation 100-octane fuel, are possible and are being produced with the aid of tetraethyl lead. The 100-octane aviation fuel used in warplanes is not a gasoline in the ordinary sense, but is a super-fuel produced by rearranging the petroleum hydrocarbon molecules through use of catalysts. Commercial airplanes use 91-octane aviation fuel, which is satisfactory even for the largest commercial airliners.

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#### PUBLIC HEALTH

## Mosquitoes Suspected

**Transmission of infantile paralysis may be due to the same insect which spreads malaria, studies in the Chicago area epidemic of last fall indicate.**

► SIGNS pointing to mosquitoes as spreaders of infantile paralysis were reported by J. Lyell Clarke, sanitary engineer of the Des Plaines Valley, Ill., Mosquito Abatement District, at the Atlantic City meeting of the New Jersey Mosquito Extermination Association.

Mosquito transmission is only one of the possible ways in which the disease can spread, Mr. Clarke emphasized, although to him infantile paralysis has "all the earmarks" of a mosquito-borne disease.

He and his associates trapped mosquitoes in the backyards of infantile paralysis cases in the Chicago area during the August-September, 1943, epidemic, which, Mr. Clarke said, was the worst the city has ever suffered.

He found infantile paralysis as "rampant" in dirty as in clean, in rich as in poor areas of the city and suburbs. While tending the mosquito traps he noted that factors such as water, milk, sewage, food, fish, birds, rats, mice and flies varied considerably from place to place. Mosquitoes, however, were everywhere, "almost as constant as the air." The next most common factor was the English sparrow.

Laboratory experiments were made to determine whether evidence could be found to show that one or more of the 32 different species of mosquitoes found in the Chicago area had served as the transmitting agent of the infantile paralysis virus. Although 5,000 mosquitoes were caught in 67 backyards of the city, efforts to see whether the mosquitoes could give the disease to monkeys were apparently unsuccessful.

One difficulty was that instead of the mosquitoes biting the monkeys, the monkeys caught and ate the mosquitoes. Mr. Clarke has a plan for overcoming this difficulty in mass experiments next season. He did not reveal the plan, hoping that some of his colleagues might devise a better one.

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## War on Mosquito Urged

► INCREASED war on mosquitoes must be waged, regardless of money and manpower shortages, if we are to save ourselves after the present world conflict from the disastrous fate of ancient Greece and Rome, Prof. Thurlow C. Nelson, of Rutgers University, warned at the meeting.

"The very good evidence that malaria brought home by returning soldiers was an important contributing factor" to the fall of these ancient civilizations should be remembered, he urged.

Malaria is spread by mosquitoes which get the disease-causing parasites from the infected blood of patients or recovered patients. Hospitals, homes and public buildings can be screened to keep out mosquitoes but, Prof. Nelson pointed out, we are not likely to insist that our returned service men spend their lives behind screens. Nor are we likely to deny them the pleasures of picnicking, camping, canoeing, or even strolling the

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"paths about the hospital in the gathering twilight."

The weapon for protection against the spread of malaria by returning service men is to destroy the mosquitoes, in his opinion.

A warning against the danger of cocktail parties and blackwater fever, a disease which may follow attacks of one kind of malaria, was also sounded by Prof. Nelson.

"This strange malady with a mortality of approximately one out of three adults strikes with the speed of a rattlesnake and with much the same effect on the red corpuscles," he declared. "Predisposing causes to attack are chilling and overindulgence in alcohol."

"If your boy from overseas has had tropical malaria, don't celebrate his return with a cocktail party: there is a good chance that the party would be followed by a funeral."

"Grave danger" is involved, Prof. Nelson continued, in using as blood donors returned service men who have at any time suffered from malaria. He cited the record of the transmission of malaria during a blood transfusion from a father to his daughter 35 years after the father had suffered his last attack of malaria.

"Infections acquired through blood donations," he pointed out, "rise quickly, rapidly override the body's defense mechanisms and frequently end in death."

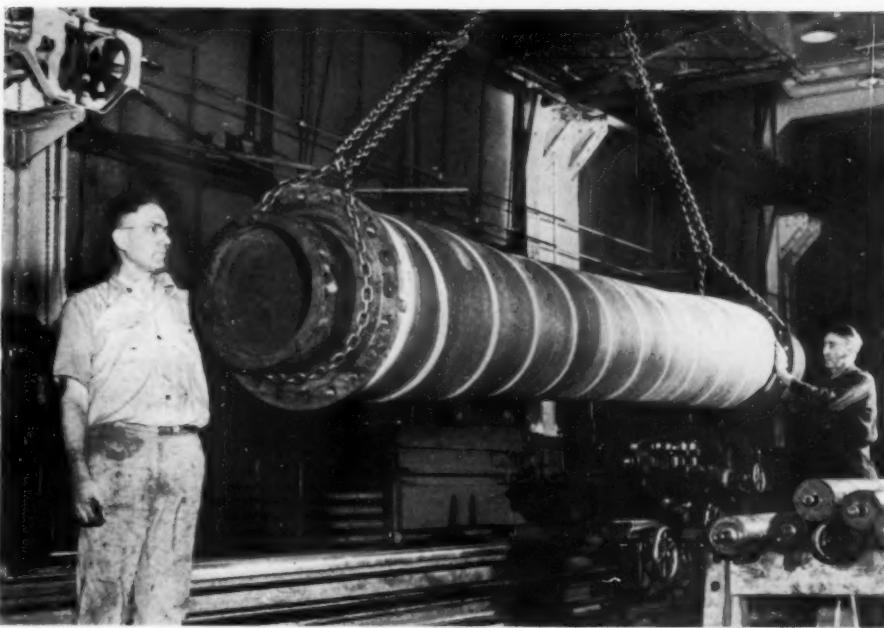
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## Testing Repellents

► MORE accurate ratings of the munitions used in protecting our fighting men in Italy and the jungle islands of the South seas against disease-carrying mosquitoes can be obtained by paired testings of the chemicals that make the pests zoom off without stopping to bite. Details of the new technique, known as paired product testing, were explained by Dr. Philip Granett of Rutgers University, speaking before the meeting.

Involving the simultaneous testing of a pair of repellents on two arms or two legs of the same individual in order to determine the relative merit of the two products tested under the same conditions, this method is, in Dr. Granett's opinion, far superior to the old system of making absolute evaluations, which varied widely among the different laboratories conducting experiments on identical repellents.

Comparison of repellents under similar conditions minimizes such disturbing variables as kind and number of insects present, nature of the test indi-



**TUBULATED**—Though it looks as rigid as a ramrod, this section of hydraulic hose, built by the B. F. Goodrich Co. at Akron, Ohio, is flexible. It is made of 14 plies of heavy duck fabric, coated with synthetic rubber and reinforced with two coils of heavy wire, and weighs 2,200 pounds. It will be used in mining rock phosphate, which is used in making fertilizers, phosphorus and medicines.

vidual, perspiration or skin conditions, amount of repellent used, light, temperature and humidity conditions, and insect desire for a blood meal.

The recently discovered fact that a superior repellent for one insect is an inferior repellent for another is giving rise to much entomological speculation. It has been shown that this reversal of relative merit has occurred between two related families of insects, as in the case of the yellow-fever mosquito and the stable biting fly; and even between the more closely allied genera, such as Aedes and Anopheles mosquitoes.

But entomologists would like to know, will a given repellent be selective for species; that is, will a repellent given top rating for warding off harmless mosquitoes also guard against the malaria-carrying species with the same success?

Until that query is answered, there can be no fool-proof mosquito check for use in malarious overseas war sectors.

Protection afforded by a repellent is measured in terms of the time interval from time of application until the insect actually bites, and by comparing extent of biting under influence of repellent with that incurred without benefit of repellent.

Uniformity of application is of the greatest importance in testing, Dr.

Granett insisted, for undertreated areas are likely to experience the first bite prematurely. When the test insect is in an unmixed population, protection time extends to the time of the first bite; when mixed species are used, tests must be continued until a bite is received on the treated area by the insect for which the repellent was primarily designed, with some approximation given as to the percentages of the different species present.

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### PUBLIC HEALTH

## Plywood Chamber Devised For Fumigating Clothes

► DEMOUNTABLE plywood chambers have been developed for fumigating the clothes of soldiers and prisoners at the front. The light-weight chamber can be erected and put into operation by a crew of six men 15 minutes after it is unloaded.

The war against the louse, notorious carrier of typhus fever, can thus be taken close to the fighting line. Tired men returning from the line of fire can be freed of vermin immediately and prisoners cleaned up before they pass to the rear.

The plywood chamber, devised by

the Research and Development Branch of the Quartermaster Corps, is light enough to handle and transport easily. The complete unit, including engine and tool box, weighs less than 1,500 pounds. The clothing of approximately 75 men can be fumigated each hour in one of these chambers.

The gas used in fumigating, methyl bromide, is a highly volatile, penetrating substance whose molecules are so fine that they can find their way through solid wood. The glue used in making plywood, however, stops them from seeping out the sides, and the joints and corners of the chamber are leak-proof.

A three-pound can of methyl bromide is placed in a cylinder attached to the exhaust of the motor and punctured by a pin. With the pressure released, and heated by the exhaust, the liquid becomes gas which is fanned into the chamber. It quickly and thoroughly penetrates the clothing or bedding packed in the chamber, instantly killing lice and other insects.

Less than 40 minutes need be allowed to fumigate all articles within the chamber and exhaust the gas so that the chamber is ready to be reloaded.

The used gas is carried off into the air over the chamber. Although a deadly poison, it dissipates quickly and becomes harmless in the open.

A peace-time use for the chamber by furriers and laundries is predicted. The gas acts rapidly, has great penetrating powers and leaves no deposit on fumigated garments.

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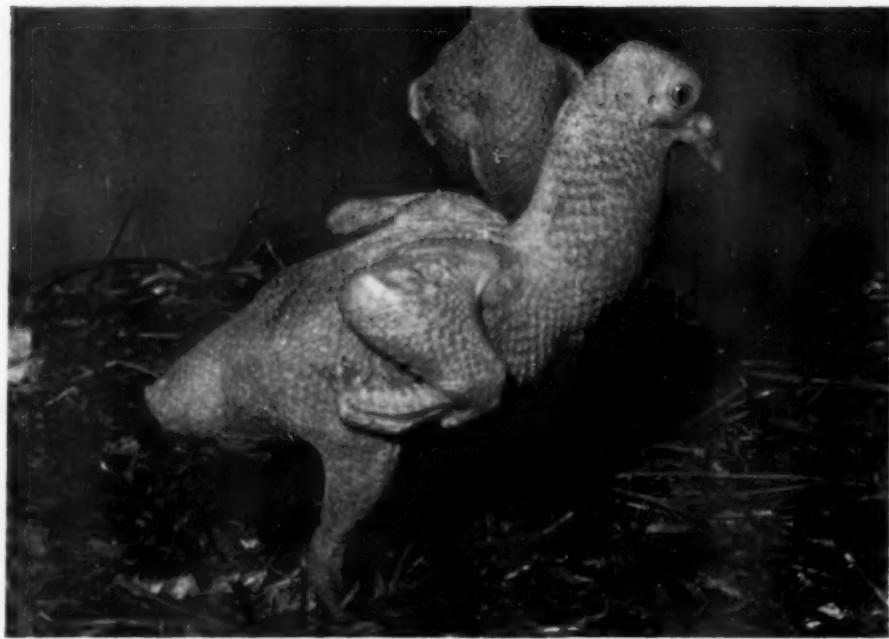
#### BACTERIOLOGY

### Pencillin Checks Growth Of Plant Disease Germs

► PENICILLIN has been found to check the growth of a bacterial species responsible for a plant disease, the destructive rot that has killed off a number of groves of the picturesque giant cactus, or sahuaro, in the Southwest. This discovery, believed to be the first proven instance of penicillin's ability to knock out a plant-disease germ, was made in studies at the University of Arizona, by Prof. J. G. Brown and Miss Alice M. Boyle.

The drug was used on colonies of the bacterium technically known as *Erwinia carnegieana*, growing on culture media in laboratory glass vessels.

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**NAKED, BUT UNASHAMED**—In the spring, no livelier iris changes on this burnished dove—he hasn't any feathers to be burnished. But that doesn't prevent him from putting on a nudist version of regular pigeon courtship. He struts and coos, bows and spreads his wings, as if he had the most dazzling kind of plumage to display before the enchanted eyes of his mate.

#### GENETICS

### Featherless Pigeons

► FEATHERLESS pigeons, naked as on the day of their hatching, strut and coo unembarrassed in cages in the genetics laboratories of the University of Wisconsin. These absurd but fascinating fowl are described by Prof. Leon J. Cole and Ray D. Owen, in the March 15 issue of the *Journal of Heredity*.

The featherless condition is hereditary, the two geneticists explain. It is rather difficult to keep the breed going, for a full suit of feathers plays an important part in normal mating, so that though the birds find their nakedness no embarrassment it is nevertheless a handicap. Artificial insemination has been used in propagation, but this laboratory technique is rather difficult. Add to this the facts that the birds are not naturally very fertile, and that they suffer easily from cold, and it becomes easily evident why no encouragement is offered to hopeful potential buyers of squabs that would not need plucking.

Actually, even if the breed became numerous enough to be marketed, it might still be a disappointment in this respect, for the birds do produce a

crop of what might be called permanent pin-feathers. Rudimentary or abortive feathers start to grow, and some of the stiff quill-feathers on the wings may become a half-inch or so in length. These are kept frayed off and worn down by the birds' ordinary activities.

The featherless pigeons seem to be unconscious of having nothing on, for they persist in action-patterns that go with feathers and in their absence simply make the birds appear absurd. Thus, when one of them is set down on the edge of a table it immediately takes off as if in flight, flapping its bare wings vigorously, and of course inevitably crashes.

Courtship activities, in which feathers normally play as important a part as fine clothes in the young of the human species, produce some especially absurd antics.

As the two Wisconsin scientists describe it: "They are also active and aggressive lovers. Inadequate attire produces no inferiority complex in them: they strut and coo, puff and bow as if arrayed in the finest of raiment."

Once, in pity of their nakedness, the geneticists tried to clothe the pigeons. They had little sweaters knitted for them. But the birds resented these so actively that they finally had to take

## MEDICINE

## Birth of Quints Rare

**Scientists waiting for confirmation of report that Argentine mother has had quintuplets. If verified, will be first authentic case in South America.**

► SCIENTISTS in the United States are waiting with interest for scientific confirmation of the report from Argentina of the birth of quintuplets there. Such reports of multiple births are fairly frequent, but the birth of quintuplets is very rare.

Some error would seem likely in the report circulated in the U. S. that the five babies weigh between 20 and 25 pounds each at the age of eight months. While this is a normal weight for a single baby at that age, the Dionne quintuplets did not average 20 pounds in weight until they were about 18 months and did not reach 25 until they were about two and a half years.

Medical records show that 60 such sets of five babies born at the same time have been widely reported, but of these only 47 are considered to be authentic, according to an authority on multiple births, Dr. H. H. Newman, of the University of Chicago.

No authentic case of quintuplet births has ever been reported from South America. England leads the world in the production of quintuplets with nine sets on record. The United States has had four sets, but in none did all five babies survive more than a few days. In fact in the most recent set, born in 1936 in Durham, N. C., only four babies were completely formed.

Our most recent hope of a quintuplet birth, at Miami, Fla., in 1940, turned

them off and leave them to their natural nudist ways. To keep them from being killed by cold, they simply see that their cages are always near a radiator.

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harvested late in the afternoon, at five or six o'clock, and the following morning at seven or eight o'clock. Samples were taken for a period of five or six days to observe the influence of changing weather conditions. Four days were clear, and two were cloudy.

With spinach, for example, he found the vitamin C content somewhat higher in the evening than in the morning, explainable by the higher water content of plants in the morning. On a dry-weight basis, vitamin C changes became insignificant. One cloudy day did seem to lower the vitamin C content somewhat. On the other hand, in a later experiment kale, after a period of six cloudy days, had as much vitamin C as it did after a week of bright sunshine.

Even over an entire season changes in vitamin C are small, Prof. Platenius reports. Kale leaves harvested the middle of November had only 15% less vitamin C than leaves from the same plants harvested in July.

He concludes that time of harvest has no material effect on the food value of vegetables, at least as far as vitamin C is concerned, and advises commercial growers to continue to harvest their crops at a time best suited to their marketing schedule. Nor do housewives have to stay up late nights to do the home canning.

"What does remain important is to get vegetables from the garden to the cooking pot with the least delay."

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## AERONAUTICS

## Airplane Engine Cowling Cuts Down Turbulence

► A TURBULENCE-abating engine cowling for airplanes invented by F. E. Flader and D. R. Berlin, of Kenmore and Eggertsville, N. Y., respectively, has been granted patent 2,343,655. The angle between the engine housing and the pilot's "greenhouse" on some high-wing types interferes with lift because of the turbulence it produces at low flying speeds. To break this up, air slits are provided on the upper side of the cowling, with suitable shutters to control them. When turbulence threatens, they are opened and the issuing air jets break it up.

Rights in the patent are assigned to the Curtiss-Wright Corporation.

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## NUTRITION

## Harvesting Vitamins

► THE TIME of harvest of vegetables has been found to have small effect on their food values.

Knowing that vegetables grown in greenhouses in winter are lower in vitamins A and C than those grown outdoors in summer, Prof. Hans Platenius

of the department of vegetable crops at Cornell University decided to see how much sunlight is a factor in producing vitamin C.

He experimented with six vegetables, all excellent sources of vitamin C, in a home garden last summer. They were

## AGRICULTURE

## Tobacco Stems Usable After Machine Treatment

► A MACHINE treatment that makes tobacco stems usable without stripping them out of the leaves is the subject of patent 2,344,106, obtained by Charles L. Reed of Richmond, Va., and assigned by him to Larus & Brother Company, also of Richmond.

It is the usual practice to cut the two halves of the tobacco leaf away from the midrib (called "stem" in the trade), which is subsequently treated and utilized separately. This increases the labor involved, and hence the costs. Softening treatments could not be applied to the whole structure, because they would ruin the leaf while modifying the stem.

In the new method, the stem is clamped in a narrow chamber, with practically the whole of the leaf extending outside. The treating fluids or gases are then applied to the stem, under pressure, and when the treatment is completed, leaf, stem and all are sufficiently uniform in texture to permit their use together.

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## MATHEMATICS

## Ovals Should Be Used To Map Airplane Ranges

► NOT CONCENTRIC circles, but complicated ovals, or even curves running off the paper, should be used to correctly map on a flat surface airplane ranges of 500, 1,000, and 1,500 miles or more, Prof. Edward Kasner of Columbia University and Prof. John De Cicco of Illinois Institute of Technology stated in a paper presented to the American Mathematical Society in New York.

Concentric circles of a sphere cannot accurately be represented by concentric circles in a plane, the mathematicians pointed out. No single map can be used to exactly represent the surface of a sphere.

"A map is not a perfect picture, but at best a systematic caricature," Prof. Kasner stated. "Various types of maps are faithful with respect to angles or areas or geodesics or loxodromes, but not to all of them. In the Mercator projection, the scale varies from latitude to longitude. In a general conformal map, where the angles are correct, the scale varies from point to point, and therefore is a function of the latitude and longitude."

One of the most famous conformal

maps is the stereographic projection, known to Ptolemy during the second century, where angles are correctly represented. Another is the Mercator projection, where the regions around the poles are greatly exaggerated since the longitude and latitude lines meet each other at right angles. The Ptolemy and Mercator maps, together with the Lambert map, are the only possible maps whose scale curves are straight or circular.

When mapping is not conformal the scale depends not only upon the point itself, but also upon the direction.

Among the famous non-conformal maps are azimuth equidistant projection and azimuth equi-area projection, used extensively in recent air-ways literature. For each of these, the scale varies in a complicated manner which cannot usually be shown on a map, but can only be described analytically.

"In all conformal maps, the scale curves form a simple-infinite family, depending on one parameter; but in all non-conformal maps, the scale curves form a double-infinite family, since they depend on two parameters," Prof. Kasner stated. These new curve families have interesting geometric properties, which may be useful in practice.

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## METALLURGY

## Electroplating Units Perform Two Processes

► BOTH TIN plate and zinc-coated steel sheets are produced interchangeably on the same electroplating lines in a new precision unit of the Weirton Steel Company, Weirton, W. Va. Three lines of electrically operated equipment, each 400 feet long, turn out electrolytic zinc-coated sheets at the rate of 160 feet a minute. The equipment is the type developed recently for tin-plating that has revolutionized the production of this widely used war and civilian material.

For zinc coating a bath is made with zinc chloride, sodium chloride and aluminum chloride. The electric current carries zinc from pure zinc fixed terminals and deposits it on the moving metal sheets. Low-voltage generators deliver 60,000 amperes of power to the plating unit at all times while in use.

Tests of the product show, it is claimed, that there is a much tighter bond between the zinc and the steel plate than can be obtained by the older hot-dip method.

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## ORDNANCE

## Chinese General Patents Improved Gun Carriage

► INVENTION of an improved field-gun carriage that enables the gun crew to get their weapon into action more quickly, yet with less labor, has won U. S. patent 2,344,252 for a high-ranking Chinese officer now on duty in Washington, Maj. Gen. Piao Kiang, of the Office of Combined Chiefs of Staff.

Modern light field pieces and anti-tank guns no longer fire with their wheels resting on the ground. Instead, a base plate, as nearly as possible directly under the gun's center of gravity, is thrust against the ground by a jack, until the wheels are lifted clear. With the ends of the split trail, spread out to the rear, this forms a solid, stable tripod.

A drawback of the present system, however, is the time and labor involved in manipulating the jack and lifting the considerable weight of the gun, even a few inches.

General Kiang obviates this difficulty by having the spindles on which the wheels are mounted made integral with the front ends of the trail sections, at such an angle that when the latter are swung into firing position the wheels are moved obliquely forward and upward. At the same time, an ingenious arrangement of levers and cam surfaces swings the base plate downward into contact with the ground and causes it to support the weight of the gun.

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## AERONAUTICS

## Counter-Rotating Plane Supercharger Invented

► A SUPERCHARGER for engines of high-flying planes, made more efficient by having two sets of turbine-like blades rotating against each other in opposite directions, is the subject of patent 2,344,366, issued to Nathan C. Price of Hollywood, Calif. The increased efficiency of this counter-rotating supercharger, the inventor states, permits more compact construction, lighter weight and lower operating speeds. Patent rights are assigned to the Lockheed Aircraft Corporation.

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# NE FIELDS

## AGRICULTURE

## Mountains of Peanuts Mean Oil, Stock Feed

### See Front Cover

► PEANUTS enough to wallow in would represent Paradise on earth to many a small boy. The one pictured on the cover of this SCIENCE NEWS LETTER, however, seems to be taking his unique privilege calmly enough. That is probably because he is a Floridian; they raise peanuts to feed to the pigs in that fortunate state.

Little is wasted about the peanut plant, in the southern areas where it is grown on a large scale. The stalks are dried for hay, and since peanuts are legumes it makes a very nutritious, high-nitrogen hay. Oil pressed from the seeds is one of our best food oils, and plays several important roles in industry as well. This is doubly the case since the war deprived us of the larger part of the coconut oil that used to come from the Philippines and other tropical lands, necessitating replacements with domestically grown vegetable oils.

Finally, the press-cake left after the oil has been extracted is a valuable concentrated food for cattle, and with proper treatment makes a good material for the protein enrichment of other foods.

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## ENGINEERING

## Telephone Toll Calls Handled Automatically

► TELEPHONE toll and long distance calls are now handled automatically by an apparatus that forms part of a switching system used by the Bell System in a new toll office in Philadelphia. The user places his call with the long distance operator as usual, and the operator dials directly the called number in the distant town or city.

Another new development, known as automatic ticketing, is in use in a suburban office in the Los Angeles area. With this system subscribers in metropolitan areas will be able to dial directly most of their calls to nearby points, and the equipment will automatically prepare a printed ticket for each call, showing

all information needed for charging the call to the proper subscriber.

These are two of the outstanding additions to the automatic or dial switching now in use with two-thirds of the Bell System telephones throughout the country. These installations were made in 1943 in spite of war conditions, and will be followed by further installations.

Post-war expansion of the telephone system now planned, including the installations of these new automatic toll devices and improvements suspended because of the war, will require many millions of dollars and give employment to thousands of men. Equipment manufacturers will also have a part in the program. The Western Electric Company makes much of the telephone equipment for the Bell System companies; before it can resume the production of telephone apparatus, reconversion of its plants, now used in manufacturing special war products, will be necessary.

Another telephone development which will be extended after the war is the expansion of the coaxial cable system. These cables are capable of carrying several hundred telephone conversations at the same time. They consist of two tubes, little larger than lead pencils, with a copper wire in each extending along its axis. They will probably play an important part in post-war television.

*Science News Letter, March 25, 1944*

## PHYSICS

## Italian's Novel Machine Converts Motion to Heat

► A CURIOUS reversal of the customary heat-to-motion relationship is represented in patent 2,344,075, granted to Alessandro Beldimano of Rome, and now vested in the Alien Property Custodian.

Most of our machinery is concerned with some part of the cycle of the conversion of heat into mechanical energy, or motion, as in the steam turbine or the internal combustion engine. Perhaps influenced by his country's poverty in fuel, Signor Beldimano has devised a simple engine for converting motion into heat. Essentially it is simply a device for stirring a liquid with paddles, rotating in a cylinder, briskly enough to warm it up. The needed mechanical energy, he suggests, can be obtained directly from a windmill. Thus the same wind that has chilled you out-of-doors may be put to work to warm you once you come into the house.

*Science News Letter, March 25, 1944*

## ENGINEERING

## Zero Octane Gasoline May Operate Future Autos

► ZERO OCTANE gasoline, not the much discussed 100-octane aviation fuel, may be used in the future to power the family car. This possibility is advanced by Dr. Carlton H. Schlesman, head of the research laboratories of the Socony-Vacuum Oil Company. He states a "most radical power plant" is already under development which makes use of radiant energy from low-grade fuels.

In this new engine, he said, "Fuel of low or even zero octane number is burned inside a gas mantel. Radiant energy is thus produced at high efficiency. This energy impinges on photo-electric cells which convert it into electrical energy. Such energy drives small electric motors mounted at the wheels."

The necessary light-weight, high-powered electric motor, up to now the missing link in the evolution of this new power system, has been developed and is available for use. Dr. Schlesman claims the new power plant will provide "unbelievable economy."

*Science News Letter, March 25, 1944*

## PLANT PATHOLOGY

## Daisies Now Blamed For Potato Disease

► DAISIES carry the virus that causes the yellow-dwarf disease of potatoes, according to studies conducted at the Cornell University Agricultural Experiment Station. Formerly, clovers were considered the source of the virus.

Daisies and a few other weeds actually carry the disease, and the virus is spread to potato plants by the clover leafhopper when the insects move to green potato fields from adjoining abandoned fields or meadows, Dr. S. G. Younkin found. Movement is usually in dry weather or after hay has been cut.

About 45 per cent of the daisy plants in the test fields carried the virus, while only three per cent of any other weed was found infected with yellow dwarf. Only one clover plant in the test plots was found infected.

The disease causes severe crop losses if tubers from infected potato plants are used for seed the following year. Reduction of the disease calls for control of the daisies and other perennial weeds on farmlands. Resistant varieties of potatoes, too, can be grown.

*Science News Letter, March 25, 1944*

## ASTRONOMY

# Mercury Appears Briefly

Seldom-seen innermost planet will be visible for a short time in April. Discrepancy in its movement can now be explained by the relativity theory.

By JAMES STOKLEY

► MERCURY, the innermost of the planets, and one that a great majority of people have never seen, will make one of its brief appearances in April. If you would be a member of the lodge of those who have viewed this little world, look toward the western sky just after the sun has set on April 12. As the sky darkens you may see the planet, looking like a star of the zero magnitude, just a little north of the west point. It will be near the horizon. Even at sunset on the 12th it will only be about 16 degrees high, and that is roughly the angular distance from the tip of your thumb to the tip of your little finger, when they are spread as far apart as possible and held at arm's length. By the time the sky is dark enough to show Mercury, it will have descended lower, due to the rotation of the earth. And about an hour and three-quarters after sunset Mercury will also be below the horizon.

This means that if you want to see Mercury, you have to have a clear sky toward the west. However, its visibility will not be confined only to the 12th, as it should be nearly as well seen for a few days before and after that date.

Mercury is not shown on the accompanying maps, as it sets before the times for which they are prepared. This is 11:00 p. m., your own war time, on April 1, and 10:00 p. m. on the 15th. On them are indicated three other planets which are visible to you, in case you miss Mercury.

## Brightest Body

Brightest of them all—brightest body, in fact, in the night-time sky with the exception of the moon—is Jupiter, high in the south and just to the right of the "sickle," part of Leo, the lion, and of which the bright star Regulus is a component. The star is of magnitude 1.3, so it ranks as first, but the present magnitude of Jupiter is about minus 1.8, which means that the planet is 17 times as bright as the star.

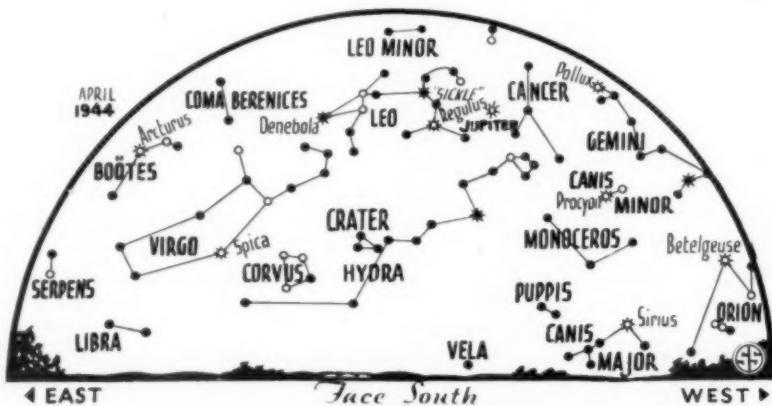
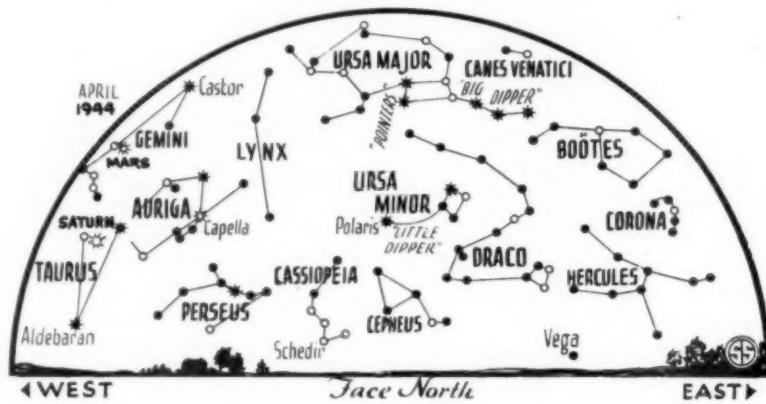
Saturn is shown to the west, in the

figure of Taurus, the bull, and just above the first magnitude star Aldebaran, which looks fainter because it is so low in the sky. Its magnitude is plus 0.3, so even it is some two and a half times the brightness of Regulus. It does not, however, equal Sirius, toward the southwest. The third planet is Mars, in Gemini, the twins, which is directly above Taurus. Mars is approximately the same brightness as Regulus (1.4) although it is rather difficult to compare the stars and planets in brilliance. The latter shine with a steady glow, while the former, mere points of light, often show the familiar effect of twinkling.

In addition to Sirius and Regulus there are several other stars of the first magnitude on view. The great winter-time constellation of Orion, the warrior,

is disappearing from view in the west, but Betelgeuse still remains in sight, above the three stars of Orion's belt. Vega, in Lyra, the lyre, is seen low in the northeast, and later at night, when it rises higher, shines more brightly. The big dipper, part of Ursa Major, the great bear, is high in the north, and while it contains no stars of magnitude one, it can be used to find two that have that distinction. Follow the curve of the dipper's handle to the east, and you come to Arcturus, in Boötes, and still farther along the same curve, you reach Spica, in Virgo, the virgin. Then also there is Procyon, in the lesser dog, Canis Minor, which is about halfway between Jupiter and Betelgeuse, toward the southwest. Above Canis Minor is Gemini, the twins, in which Mars appears, and of which the star Pollux is also first magnitude.

Although Mercury is the innermost of the planets (revolving at a mean distance of 36,000,000 miles from the sun, instead of the earth's 93,000,000)



\* \* • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

there was a time when astronomers, or some of them at least, thought there was another still nearer. Some books on astronomy published in the 1860's and 70's record Vulcan, revolving around the sun once in about 18 days (Mercury goes around it in 88 days) at a distance of 13,000,000 miles. Such a planet would be much harder to see than Mercury, and would never get far enough away from the sun to be seen even in twilight. It would be observable only in two ways. One would be at a total eclipse, when the moon covered the sun and hid its glare, and the other would be at a time of transit, that is, when the planet went directly in front of the sun. Because of its proximity to the sun, such transits could be considerably more frequent than those of Mercury and Venus.

#### Discovery of Neptune

The discovery of Neptune in 1845 had paved the way for this supposed discovery of Vulcan. Uranus had been discovered by Herschel in 1781, but it did not move quite the way that astronomers calculated it would. By 1845 two astronomers, J. C. Adams, in England, and U. J. J. Leverrier in France, had decided that the reason was the pull of another, and then unknown planet. They independently calculated where the new planet would be, and when astronomers looked they found it there—and named it Neptune.

Then Leverrier also investigated the movement of Mercury, found a discrepancy there, and announced in 1859 that either the mass of Venus was about 10% greater than had been supposed, or that there was another planet or planets, moving around the sun inside the orbit of Mercury.

#### Observed Strange Object

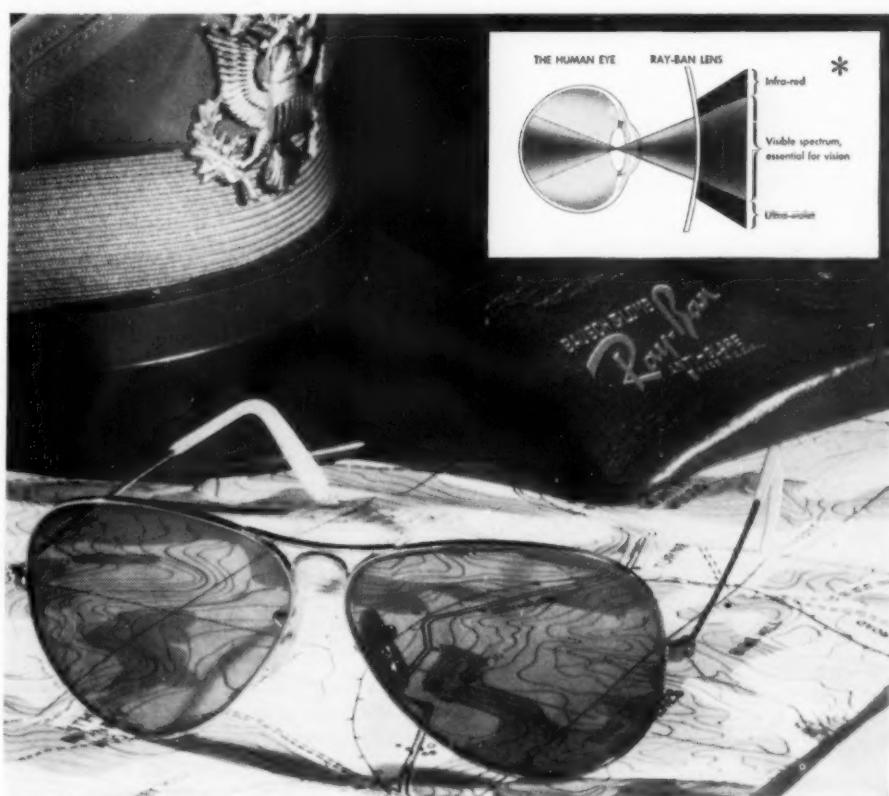
This announcement led a French physician, M. Lescarbault, to announce that on March 26, 1859, some months earlier, he had observed a strange object cross the face of the sun, that he thought it was a planet but had hesitated to announce it until he was sure. As a result, Leverrier went to see the doctor, very skeptical at first but came away satisfied that a new planet had been found.

When astronomers looked for it on later occasions, however, they could not locate it. For a number of years special photographs were made at solar eclipses to find such an object, but always in vain, until now we know that there is no such planet brighter than the

eighth magnitude, nor bigger than 30 miles in diameter. The discrepancy in the movement of Mercury has been explained on the basis of the relativity theory. So far it has not been definitely explained what Lescarbault, and others, too, actually watched when they supposed they were watching a planet. Some may have seen sunspots of a curious kind, though this would not explain all the observations. But deceived in some way they must have been.

But what about Mercury itself, which

is by no means imaginary? It is a large edition of the moon, and probably has a similar surface, although it cannot be seen well enough to tell whether there are craters like the lunar ones. It has no atmosphere, mainly because of its small mass. If you fired a bullet on Mercury at a speed of more than 2.3 miles per second it would leave the planet, never to return, as this would overcome its gravitational field. If it had an atmosphere, being so close to the sun, the molecules would move faster than this, and (*Turn to next page*)



#### Scientific glare protection . . . for your flyers

 When your boy starts on a daylight bombing mission, or gets into a fight above the clouds, he needs more in front of his eyes than "colored glasses." He needs safe, scientific protection from punishing glare—lenses that filter out ultra-violet and infra-red. Ray-Ban Sun Glasses give him a cool, sharp, instantly clear view of enemy landscape or planes.

Ray-Ban is the name of a type of glass created by Bausch & Lomb for exactly that sort of performance. For twelve years Ray-Ban lenses and Ray-Ban Sun Glasses have been used to equip the Army and Navy. And thousands upon thousands of civilians have found in Ray-Ban's comfortable, scientifically correct glare protection

the perfect answer to eye distress, the ideal glass for outdoor wear.

Ray-Ban visual comfort and efficiency will be available to more millions—after Peace. For today, with Ray-Ban production at a record high, all are going for military use.

\*To make vision comfortable and clear, Ray-Ban lenses filter out ultra-violet, infra-red and glare, transmit to the eyes the rays of light useful for seeing.

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# Do You Know?

*Oil* was extracted from shale in Scotland as early as 1694.

The peel of *apples* is five times as rich in vitamin C as the flesh.

In 1942, a total of 2,808,996 *births* and 1,385,187 *deaths* were registered in the United States.

Applications for *air routes* from the United States to the other Americas have been filed by 25 companies.

*Battlescrap*, salvaged from battlefields and elsewhere, is becoming an important source of raw materials, particularly of metals.

Two species of *Sequoia* are all that remain today of some 45 species described from fossil beds in the Northern Hemisphere.

*Butter* is a mixture of milk fat, water, casein, salt, lactic acid, and coloring; federal standards call for at least 82.5% butter fat and not over 16% water.

"*WASPS*," civilian flyers of the Women's Airforce Service Pilots, have averaged 3,000,000 flying miles per fatal accident; they are now flying approximately 5,000,000 miles a month.

The fight against *tuberculosis* in the United States is making rapid progress; the mortality rate was cut in half during the first 20 years of the present century and halved again by 1940.

Radio telephone service is now open between the United States and Trinidad, the most southerly island of the West Indies; it is handled through short-wave telephone facilities at Miami, Fla.

*Carnauba wax* from Brazilian palms, formerly used in lipsticks, phonograph records, furniture polishes and for other purposes, is now used as a waterproofing and protective coating on war materials.

*Muskrats* are able to swing their lower jaws forward to sharpen the lower teeth against the upper, and the upper against the lower; the teeth are curved and grow continuously and must be kept worn away and sharpened.

## From Page 203

they, too, would leave forever. We on earth are more fortunate. The velocity of escape—the speed at which a bullet would have to be fired to leave our planet—is 7.5 miles per second, considerably higher than the average speed of our air molecules, so that is why our atmosphere stays with us.

Just as the moon always keeps the same half toward the earth, so Mercury always has the same hemisphere facing the sun. The result is that this part is hotter than any other planet, or about 770 degrees Fahrenheit, as measured by Drs. Edison Pettit and Seth B. Nicholson at the Mt. Wilson Observatory. Lead and tin both melt at this temperature. On the other hand, the dark side is exceedingly cold, close to the absolute zero of space, since there is no circulating atmosphere to warm it. And so Mercury has the unique distinction of having both the maximum and minimum temperatures among the planets.

As it did earlier this year, on Jan. 13, the moon will pass in front of Jupiter and "ocult" it on April 30, but unfortunately it will take place between the hours, approximately, of 4:00 and 5:00 p. m., EWT, which is

during daylight. Thus, it will hardly be visible to the unaided eye (as it will be in Europe, where it occurs at night), but a small telescope will show the moon approaching the planet, and Jupiter's reappearance as the occultation ends. That evening, of course, the two bodies will still be close together. The moon will be about at first quarter. As it moves toward the east, the planet will be hidden by the dark edge. All over the United States and Canada the occultation will be observable, except that along the west coast the hiding of Jupiter will take place before the moon rises.

## Celestial Time Table for April

April EWT	
3	9:39 a.m.
4	2:00 p.m.
8	1:22 p.m.
12	6:00 a.m.
13	3:00 a.m.
16	1:59 a.m.
20	10:00 a.m.
21	early a.m.
22	7:18 a.m.
26	8:43 p.m.
28	4:33 a.m.
30	2:06 a.m.
	4:30 p.m.

Moon passes Jupiter.  
Moon farthest: distance 252,-000 miles.  
Full moon.  
Mercury farthest east of sun.  
Jupiter changes from westward to eastward motion.  
Moon in last quarter.  
Moon nearest: distance 225,-900 miles.  
Meteors of Lyrid shower visible.  
Moon passes Venus.  
New moon.  
Moon passes Saturn.  
Moon passes Mars.  
Moon in first quarter.  
Moon occults Jupiter.

Subtract one hour for CWT, two hours for MWT, and three for PWT.

Science News Letter, March 25, 1944

## METEOROLOGY

# Maps of World Climates

► SUPPOSE your regiment has been ordered to Timbuktu or Kamchatka or some other outlandish place you've hardly ever heard of. How can your supply officer be sure you and your buddies will be dressed and outfitted to be comfortable in the climate they will meet there?

A glance at the series of new monthly climatic maps of the world prepared by the Army Map Service will go far toward solving the problem. These maps show what kind of weather may be expected, on the average, each month in the year over all six of the world's continents. Each kind of climate is shown by a distinctive color, so all you need to do is find a matching color on the map of North America or other familiar region, and plan accordingly.

Thus, Timbuktu in June is colored up like western Texas in July. You'll find the same color around Darwin, in northern Australia, right now—it's still high summer in the southern hemisphere.

By matching colors on these new

maps, the supply officer will learn that Tokyo weather is virtually identical with that of Washington, D. C.; that the terrific Russian winters are about like normal winters in northern Minnesota, North Dakota or Maine; that the city of Duluth is climatically about on a par with Leningrad; and that Bismarck, N. Dak., has a climate similar to that of Moscow.

This newly developed monthly breakdown replaces the very general system of dividing the world into yearly regional climates. Presenting complete information on the rainfall, temperature and humidity, the maps are an invaluable aid in the determination of types of clothing and equipment for our fighting forces stationed at distant and heretofore relatively unknown and uncharted regions.

Looking into the future, Major W. F. Heald of the Climatological Unit of the Quartermaster Corps predicts a very practical peacetime use of these maps when pleasure travel is again in order.

Science News Letter, March 25, 1944



## How far could a "PT" go on an "A" ticket?

► A month's supply of "A" tickets would allow barely enough gasoline to warm up the three huge engines of one of these Jap-smashers. And it would have to be high octane gasoline to be of any use at all.

The point is that all our gasoline fighting machines—land, sea and air—require enormous quantities of high octane fuel. And that's why there's less gasoline in the U.S.A. for civilians—and less Ethyl fluid to raise its quality, in spite of stepped-up Ethyl production.

Every gallon of America's fighting gasoline contains Ethyl fluid.

Today, more and more Ethyl is going overseas. But someday—*after the war*—this high octane gasoline will stay home. Result: gasoline for automobiles, airplanes, trucks, buses and tractors of higher quality than Americans ever enjoyed before. Ultimately engines will be designed to

take full advantage of this gasoline.

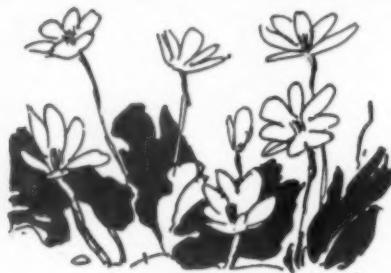
In this post-war development, the Ethyl Corporation looks forward to playing a special part. Through our Detroit and San Bernardino laboratories, now busy with war work, we plan to work closely with automotive, aviation, tractor and petroleum engineers—helping them to get the most from post-war gasoline and engines.

### ETHYL CORPORATION

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CHRYSLER BUILDING, NEW YORK CITY



**Preformed Flowers**

► THE RICH dower of beauty with which our woodlands present us each spring is no improvisation of the moment. It was all carefully prepared and laid by during the preceding summer and early autumn, in bulb and corm and rootstock underground, in well-protected buds on woody twigs of tree and shrub and vine. At least the beginnings of the flowers were ready before the first frosts stopped further growth; in many species well-advanced details of petals and stamens and pistil were present in the tightly-packed, tucked-away buds.

This can readily be demonstrated by carefully prying the tough scales off the fat buds of a lilac or similar flowering shrub, perhaps soaking the twig in warmish water for a half hour first, to soften it up. Patience, a good needle, and preferably a hand lens are all the equipment required. Beneath the bud-scales you will find a pair of tightly-folded little leaves, and within these the flower-cluster, tiny but unmistakable, looking like a bunch of almost microscopic green grapes.

If you want to find the flower-beginnings in a non-woody plant, the best

thing to work on is a dormant bulb of a hyacinth, tulip or the like. A thin, sharp knife is needed for this kind of dissection—and discerning eyesight as well, for the telescoped embryo flower structures are all of the same pallid juiciness as the bulb-scales themselves. But with patience, and a few discarded bulbs on which to practice, you can find the parts all there.

It is quite natural, of course, that the first flowers should be these preformed ones, laid down months before and ready to go into action when the right conditions of temperature, light and moisture give the signal. Annual plants, that grow anew each year, must take time to sprout from the seed, get their roots into the ground and their tops into the sunlight, and prepare the necessary reserves of foodstuffs, all before the serious and rather costly business of flower formation can be under-

taken. That is, at the shortest, a job requiring several weeks of the most diligent kind of growth. If flowers are to bloom in April and May, this preliminary work must be taken care of by the preceding August or September at the latest.

Many, perhaps most, of the perennial plant species that grow in lands where seasonal temperature differences are marked definitely require a more or less pronounced chilling before they will arouse out of their autumnal dormancy and go on into bloom. Some require a hard freeze, followed by a thorough warming-up. Others will respond to just a touch of frost and relatively little heat. Flowers of this latter kind (peach, for example) are what give orchardists premature gray hair by constantly offering to pop into premature bloom during mild winters.

Science News Letter, March 25, 1944

## ETHNOLOGY

**Prehistoric Contact**

► EARLY INDIANS of the lower Mississippi Valley may have had direct connections with Indians on the east coast of Mexico, Dr. William Duncan Strong, Director of the Ethnographic Board of Smithsonian Institution, stated in an address before the Washington Academy of Sciences.

Pottery unearthed in both areas, in excavations directed by Dr. Gordon Eckholm of the American Museum of Natural History, is decorated with similar patterns of broad, grooved, incised lines. However, Dr. Strong pointed out, as the pottery found in Mexico dates back to approximately 300 A.D. and that found in the United States is placed at approximately 1000 A.D., it indicates an 800-mile, 700-year migration of the Indians from Tampico, Mexico, to Louisiana. Most of the other significant Mexican evidence of this relationship has

long since decayed in the humid climate.

The oldest Indian culture yet unearthed in Chile and the coast of Peru—a simple fishing population which preceded the agricultural and horticultural civilizations—was also described by Dr. Strong. Fishhooks, bowls cut from lava, barbed harpoons with stone points finely flaked by pressure, and coarse percussion-flaked stone tools made by banging one stone against another to rough-shape the instrument, remain to tell of the customs of this prehistoric people. Junius Bird of the American Museum of Natural History, with Dr. Strong, brought this evidence to light in the course of a year of intensive excavation, Dr. Strong said.

"The great vistas in time and space revealed by the present program of intensive research and excavations make it abundantly clear that the field of Middle and South American archaeology is rapidly ripening, with a promise of rich scientific harvest. It has always been a field of superlative prehistoric interest, but only recently has scientific work been envisaged on sufficiently broad and clean-cut lines to give definite promise of more sweeping and valid culture-historical results," Dr. Strong predicted. "There seems little doubt that when the blight of the present war is removed this type of research work will surge forward in all the American republics."

Science News Letter, March 25, 1944

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# Books of the Week

► OUTDOOR living increases appreciation of Nature. It also increases the appetite—which makes timely and appropriate the appearance of **THE OUTDOORSMAN'S COOKBOOK**, by Arthur H. Carhart (*Macmillan*, \$1.95). General instructions are practical and tested; particular recipes cover preparation both of what you bring with you and what you catch or find in the field.

*Science News Letter*, March 25, 1944

► PHYSIOLOGISTS in particular, and biologists in general, will find much of interest in **THE PERMEABILITY OF NATURAL MEMBRANES**, by Hugh Davson and James Frederic Danielli (*Macmillan*, \$4.75). This is definitely a book for research workers.

*Science News Letter*, March 25, 1944

► DISCUSSION of the cartridges used in small-arms and small-caliber cannon up to 40 mm.) solidly fills a good-sized book titled, simply, **AMMUNITION** (*Morrow*, \$5). Written by Melvin M. Johnson, Jr., and Charles T. Haven, it is definitely professional in its reader-appeal, giving all data as fully as available, with complete tables and exact profile illustrations. There are special chapters on function, defects, external ballistics and other pertinent topics.

*Science News Letter*, March 25, 1944

► PRACTICAL problems set up by tree-ruining fungi, and practical means for meeting them under American forest conditions, are presented in **PATHOLOGY IN FOREST PRACTICE**, by D. W. Baxter (*Wiley*, \$5.50). Out of his experience as a teacher in a great forestry school, the author has built a book that can be used to advantage in forestry courses elsewhere.

*Science News Letter*, March 25, 1944

► FOOD, by Frank A. Pearson and Don Paarlberg (*Knopf*, \$2.75), is an argument against government attempts to regulate supplies and prices, the assumption being that in an uncontrolled market (even in wartime) "free" prices will be all the regulation needed.

*Science News Letter*, March 25, 1944

► THE STORY of American industry's contributions to everyday comfort

through quality improvements and quantity production in consumer goods is told by Carl Crow, in **THE GREAT AMERICAN CUSTOMER** (*Harpers*, \$3). Illustrations, taken from magazine advertisements mostly dating from the last quarter of the nineteenth century, are a story in themselves.

*Science News Letter*, March 25, 1944

## Just Off the Press

**THE EDUCATION OF T. C. MITS:** What Modern Mathematics Means to You—Hugh Gray Lieber and Lillian R. Lieber—*Norton*, 230 p., illus., \$2.50.  
**HANDBOOK FOR ARMY WIVES AND MOTHERS AND ALL OTHER DEPENDENTS**—Catherine Redmong—*Penguin*, 252 p., illus., paper, 25c.  
**ILLUSTRATED TECHNICAL DICTIONARY**—

Maxim Newmark, Ed.—*Phil. Library*, 352 p., illus., \$5.

**AN INTRODUCTION TO NAVIGATION AND NAUTICAL ASTRONOMY**—William George Shute, William Wright Shirke, George Forbes Porter, Courtenay Hemenway—*Macmillan*, 457 p., illus., \$4.50.

**THE JEWS AND MEDICINE ESSAYS**—Harry Friedenwald—*Johns Hopkins Press*, 390 p., illus., \$3.75, Vol. I.

**THE JEWS AND MEDICINE ESSAYS**—Harry Friedenwald—*Johns Hopkins Press*, 426 p., illus., \$3.75, Vol. II.

**PLANTS AND FLOWERS IN THE HOME**—Kenneth Post—*Orange Judd*, 198 p., illus., \$2.

**THE RIDDLE OF CANCER**—Charles Oberling—*Yale Univ. Press*, 196 p., \$3.

**SIX THOUSAND YEARS OF BREAD**—H. E. Jacob—*Doubleday, Doran*, 339 p., illus., \$4.50.

**YOUR POSTWAR JOB!**—Bern Williams—*Bernard & Ellis*, 64 p., illus., paper, 25c.

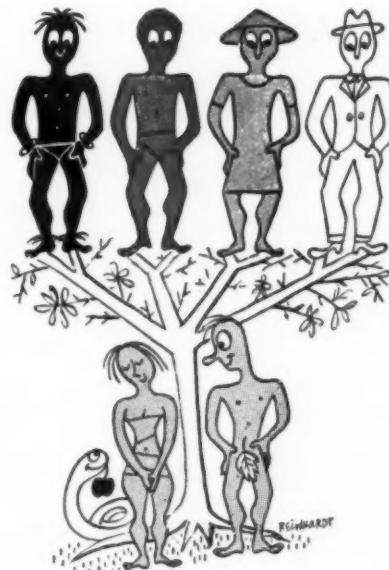
## THE RACES OF MANKIND (10c)

by Ruth Benedict and Gene Weltfish

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months . . .)

# •New Machines and Gadgets•

SYNTHETIC rubber tennis balls, now available, have bounce, resiliency and wearing qualities equal to if not better than natural rubber balls, it is claimed. An improved felt cover gives promise of a 10 per cent longer life on the court.

Science News Letter, March 25, 1944

TWO-WAY TRAFFIC recorders used on highways register separately vehicles passing in each direction. Two parallel beams of light 18 inches apart are directed across the road to control two photo-electric cells. When one beam is interrupted a thyratron, or vacuum tube, actuates a balance relay which selects and operates one of the counters.

Science News Letter, March 25, 1944

PLACED AHEAD of the machine, a newly patented lawn mower attachment cuts weeds and grass too high for the regular revolving blades. It is a reciprocal cutter much like that of the ordinary farm mowing machine.

Science News Letter, March 25, 1944

PAPER BLANKETS made of many layers of soft crepe tissue, a cellulose fiber, are claimed to be warmer than wool blankets of equal weight. With normal care they will last a season or two. Being relatively inexpen-



sive, they can be discarded instead of being laundered and thus are ideal for use on sickbeds. A folded blanket is shown in the picture.

Science News Letter, March 25, 1944

SCRATCH HARDNESS of paint films is accurately measured by a machine called a microknife. A load in grams is applied to a diamond-point cutting tool which revolves across the paint surface until the sub-surface is revealed. The weight and number of strokes measure the hardness.

Science News Letter, March 25, 1944

BOWLING BALLS with curved holes for the fingers, recently patented, will permit a stronger grip and safer release than the present straight-hole type. Either two or all three of the holes may be curved.

Science News Letter, March 25, 1944

GLOBES for classroom and home use, made without bases or other complicated mountings, will soon be available under a patent just issued. The hollow sphere is weighted on the inside so that when placed on a tabletop it comes to rest with its polar axis at the correct angle.

Science News Letter, March 25, 1944

If you want more information on the new things described here send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N St., N.W., Washington 6, D.C., and ask for Gadget Bulletin 200.

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## Question Box

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In what ways is a counter-rotating plane supercharger more efficient than other types? p. 200.

### AGRICULTURE

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### ASTRONOMY

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### BACTERIOLOGY

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### BOTANY

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### ENGINEERING

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### NUTRITION

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What invention did a Chinese general get patented? p. 200.

### PUBLIC HEALTH

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What insect is suspected of spreading infantile paralysis? p. 196.